OPTIMIZATION OF LIGHT TRANSMISSION, MECHANICAL PROPERTIES AND DIMENSIONAL STABILITY OF A THICK BAMBOO BIO-CELLULOSE (GIGANTOCLOA ALBOCILIATA) FOR SOLAR CELLS SUBSTRATE LAYER

NAME : KANG CHUANG HSIEN

IDENTITY NO : 990517-14-5575

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

INTRODUCTION

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

OBJECTIVES

To investigate the relationship between the interaction mass for the type of the blade consumed with the type of the blade consumed since the entire system is more to solar energy system.

To interrogate the relationship between the efficiency achieved by the BuzzTech 1800W 388V Cordless Grass Trimmer Mesin Rumput Household Grass Cutter Electric Lawn Mower P with variation of 88V- RED whereby bamboo blade, circular see-saw ring steel blade, triangular steel blade,nylon strings and plastic blade are consumed respectively with the interaction mass of the type of the blade consumed since the entire system is more to solar energy system.

To inspect the relationship between power output achieved by the BuzzTech 1800W 388V Cordless Grass Trimmer Mesin Rumput Household Grass Cutter Electric Lawn Mower P with variation of 88V- RED whereby bamboo blade, circular see-saw ring steel blade, triangular steel blade, nylon strings and plastic blade are consumed respectively with the interaction mass of the type of the blade consumed since the entire system is more to solar energy system.

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

Restricted to one energy resource component which is solar energy and cannot be acted vice-versa.

Only available inside the University of Putra Malaysia where seldom indulge to outside government and international activities, example given here will be Putra Science Park (PSP) UPM is a must under Postgraduate Candidature Checklist.

The traffic flows of some pathways inside in the compound of University of Putra Malaysia are limited to one way choices only.

Limitation of this research project

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

How is the the relationship between the interaction mass for the type of the blade consumed with the type of the blade consumed since the entire system is more to solar energy system?

What is the relationship between the efficiency achieved by the BuzzTech 1800W 388V Cordless Grass Trimmer Mesin Rumput Household Grass Cutter Electric Lawn Mower P with variation of 88V-RED whereby bamboo strings, bamboo rattans, circular see- saw ring steel blade, triangular steel blade, nylon strings and plastic blade are consumed respectively with the interaction mass of the type of the blade consumed since the entire system is more to solar energy system?

Why is there a relationship between power output achieved by the BuzzTech 1800W 388V Cordless Grass Trimmer Mesin Rumput Household Grass Cutter Electric Lawn Mower P with variation of 88V-RED whereby bamboo strings, bamboo rattans, circular see- saw ring steel blade, triangular steel blade, nylon strings and plastic blade are consumed respectively with the interaction mass of the type of the blade consumed since the entire system is more to solar energy system?

Research Questions

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

The rate of growth and metabolism of bamboo plant is considered to be the fastest amongst other plant species.

The elasticity of the bamboo stems are in moderated zone and arena.

The weight and mass of bamboo are to be concerned to be lighter due to its unique interior macroscopic and microscopic characteristics.

LITERATURE REVIEWS

The breaking points of one individual bamboo is weaker if compared to the infamous Agar wood.

This means and implies the harvesting and mobilization of the whole bamboo stems from one place to another are easier if compared to other di-cellulose trees and plants.

The bamboo stems are less compacted with allonized molecules, atoms and ions which cause it to be easily buoyant upon up the water surface.

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

Bamboo is difficult to get rusted but it is biodegrable when in stationary state.

The circular chains which existed inside bamboo are not in convergin g mode but in diverging mode.

The wave profiles of the bamboo are to be vibrated and not easily break if it is modified.

The magnetic power of the bamboo is weak as the ferrum and iron contents within it are not enough to attract it to the magnet compound.

ne blades of th bamboo solar cells are to be thinner instead of thicker to indicate the ability of cutting due to exertion of pressure as area involved are in descending orders.

The greenery circulation from the bamboo seen more better than nowadays plastic and steel blades which are the components of the fan.

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

RESEARCH METHOD

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Front view of the Solar plycrystalline Panel with To Micro Type-C wire)

(Back view, Solar plycrystalline Panel Solar Module Types: 012WP Maximum Power: 1.2W Maximum Electrical Voltage: 6V to 9V Maximum Electrical Current: 0.13A to 0.2A Volume of Solar plycrystalline Panel : (84× 130 ×10)mm)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Portable Rechargeable Lamb with “POWER” button of three modes)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(USB 2.0 and 3.0 To Micro Type-C wire)

(Left and Right view of the 88V electrical capsule storage for battery string trimmer, Vasily Lithium, under “FC”,it need to manage properly and not simply to any garbage bin, it is recycled but not direct exposed to “explosive and fire substances”)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Upper view of the 88V electrical capsule storage for battery string trimmer, Vasily Lithium, under “FC” with cathode and anode logo)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Front view of the 88V electrical capsule storage for battery string trimmer, Vasily Lithium, under “FC”)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Back view of the 88V electrical capsule storage for battery string trimmer, Vasily Lithium, under “FC”)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Model : TZ-C03AE Input: 100V-240V 50-60HZ Output: 21V 1000mA Under “RoHS” of the China Battery Charger)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Front view of the holder, it is the “head” of the rod)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Right view of the holder where the 88V electrical capsule storage for battery string trimmer, Vasily Lithium, under “FC”,it need to manage properly and not simply to any garbage bin, it is recycled but not direct exposed to “explosive and fire substances” is inputted to, it is the “head” of the rod, there is no sharp arrow sign on the right)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Left view of the holder where the 88V electrical capsule storage for battery string trimmer, Vasily Lithium, under “FC”,it need to manage properly and not simply to any garbage bin, it is recycled but not direct exposed to “explosive and fire substances” is inputted to, it is the “head” of the rod, there is sharp arrow sign on the left)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Stabilizer for the the “head” of the rod)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Down view of the holder where circular section inputted to, it is the “tail” of the rod)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Left or Right view of the holder with one “Down” Button, it is the “tail” of the rod)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Back view of the holder, there is one downward pusher ,it is the “tail” of the rod)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

There is one orange cover with “arrow” sign with attached to the “tail” of the rod) (Not compulsory when safety head helmet is on) (It hinder the pathway and circulation trimming for bigger circumstances involved.

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(There is two triangular steel blades which attached to the “tail” of the rod, some components attracted to high-polarized magnetic field strength)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(There is five plastic blades with one “L-shape” steel, screw and circular ring which attached to the “tail” of the rod, some components attracted to high-polarized magnetic field strength)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(There is one circular steel see-saw ring which attached to the “tail” of the rod, some components attracted to high-polarized magnetic field strength)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Bamboo String which will be the thin bamboo blades for this right for this research (×1quantitiy))

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Bamboo String which will be the thin bamboo blades for this right for this research (×5quantitiy))

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Four group of bamboo rattans)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Four yellowish Nylon strings with the circular metal mowel plate for the “tail” of the rod for this research (×3quantitiy))

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Upper View of SF-400 Electronic Balance with the capacity notation of “10000g×1g/353oz×0.1oz” , on button, off button, mode button and tare button)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Back View of SF-400 Electronic Balance with the digital scale informing that “Auto zero resetting, Auto power off, Mode functioning (g/oz) and (1.5V× 2)battery with “AAA”type)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Four Alkaline Battery plus with the 0.0% recyclable MERCURY CADMIUM, cathode and anode with the “AAA”type, LR03, 1.5V)

(Four Alkaline Battery which is made in China with the bar-coding of “9020174”, “Jiaxing Mini-Moon Battery Co,Ltd.”, “MR. D.I.Y TRADING SDN BHD” and “MC.” 201601039157(1210098-V)” (×4quantitiy))

(Engineering cloves)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Shield coat for trimming grass, laboratory work and other relevant duties)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

ANALYSIS AND FINDINGS

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(The mass of one cardboard)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(The mass of one plastic blade with the cardboard)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(The total mass of five group of bamboo strings and each of them with the length of 23.3cm, width of 0.1cm and height 0.1cm with the cardboard)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(The total mass of FOUR of bamboo rattan and each of them with the length of 23.3cm, width of 0.2cm and height 0.2cm with the cardboard)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(The total mass of four nylon strings and each of them with the length of 23.3cm, width of 0.2cm and height 0.2cm with the cardboard)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(The mass of one triangular steel blade with the cardboard)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(The mass of one circular steel see-saw ring with the cardboard)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(The mass of one circular metal mowel plate for the “tail” of the rod with the cardboard)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

TABLES AND FIGURES

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

Mass for each types of consumed blades	Minimum power output for each types of consumed blades
110	165.775
3	3.9384
27	40.666
0.36	4.65125
3	38.9092
1.5	19.4509

(Table of Minimum Power Output for Each Types of Consumed Blades (1×10-10) Versus Mass for Each Types of Consumed Blades (g))

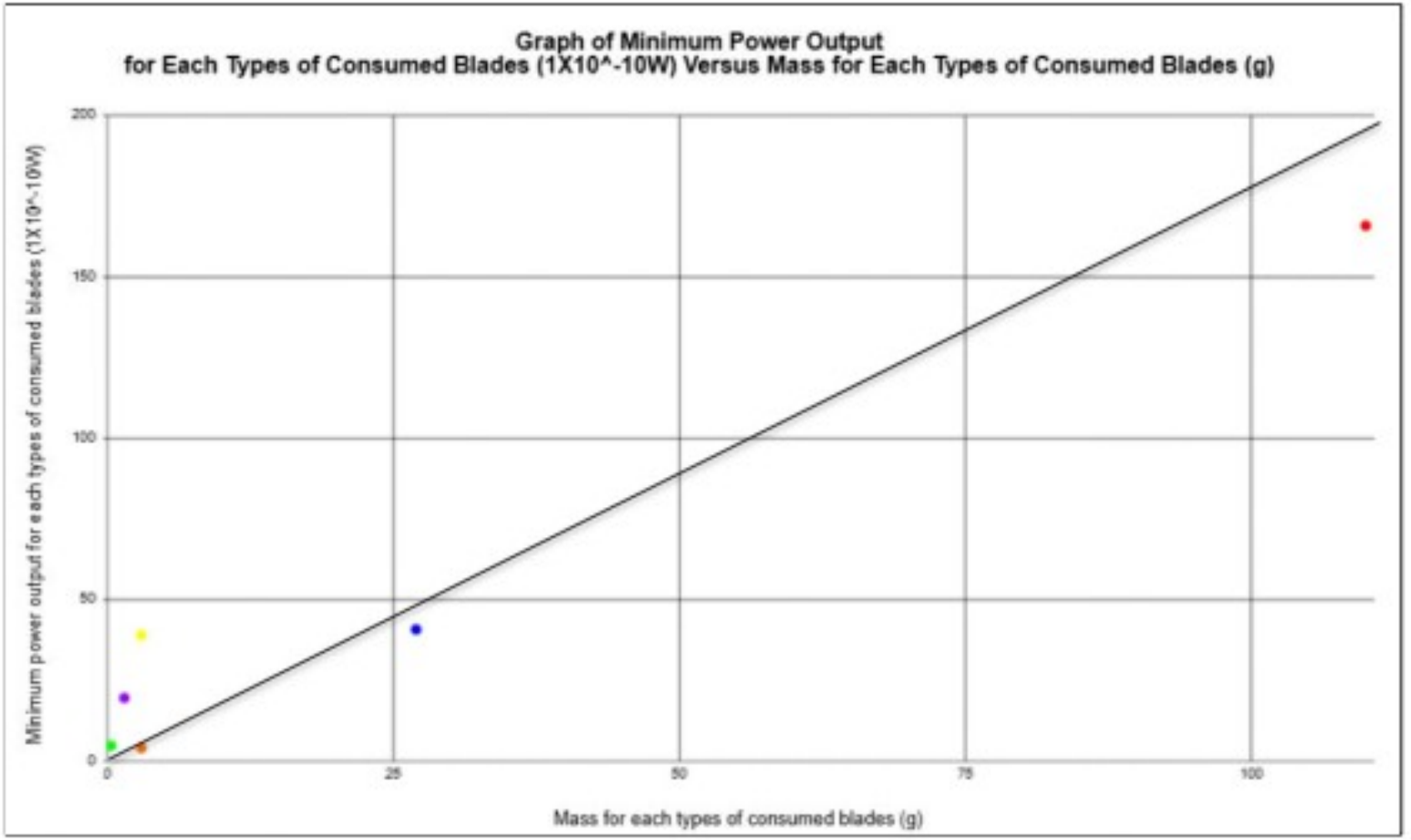
(Table of Maximum Power Output for Each Types of Consumed Blades (1×10-10) Versus Mass for Each Types of Consumed Blades (g))

Mass for each types of consumed blades	Maximum power output for each types of consumed blades
110	49.118
3	1.1669
27	12.0563
0.36	1.3832
3	11.527
1.5	5.7632

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

GRAPHICAL ANALYSIS FOR MINUMUM DURATION CONSUMPTION

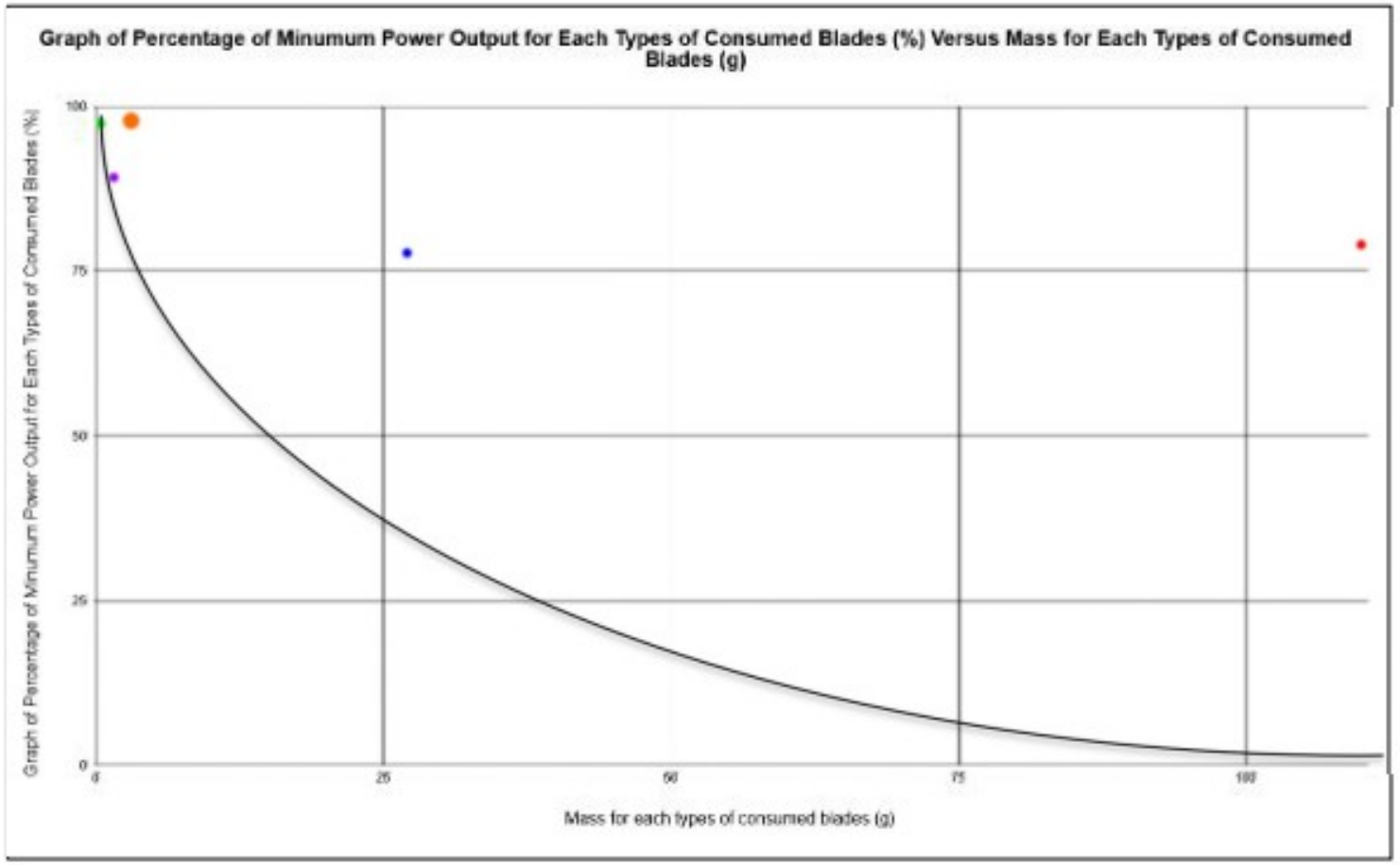
https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib



Graph of Minimum Power Output for Each Types of Consumed Blades (1×10-10W) Versus Mass for Each Types of Consumed Blades (g)

$$P_{\text{types of the materials minimum}} = (F_{\text{types of the materials minimum}} \times v_{\text{types of the materials minimum}}) = (m_{\text{types of the materials minimum}} \times a_{\text{types of the materials minimum}} \times v_{\text{types of the materials minimum}})$$

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

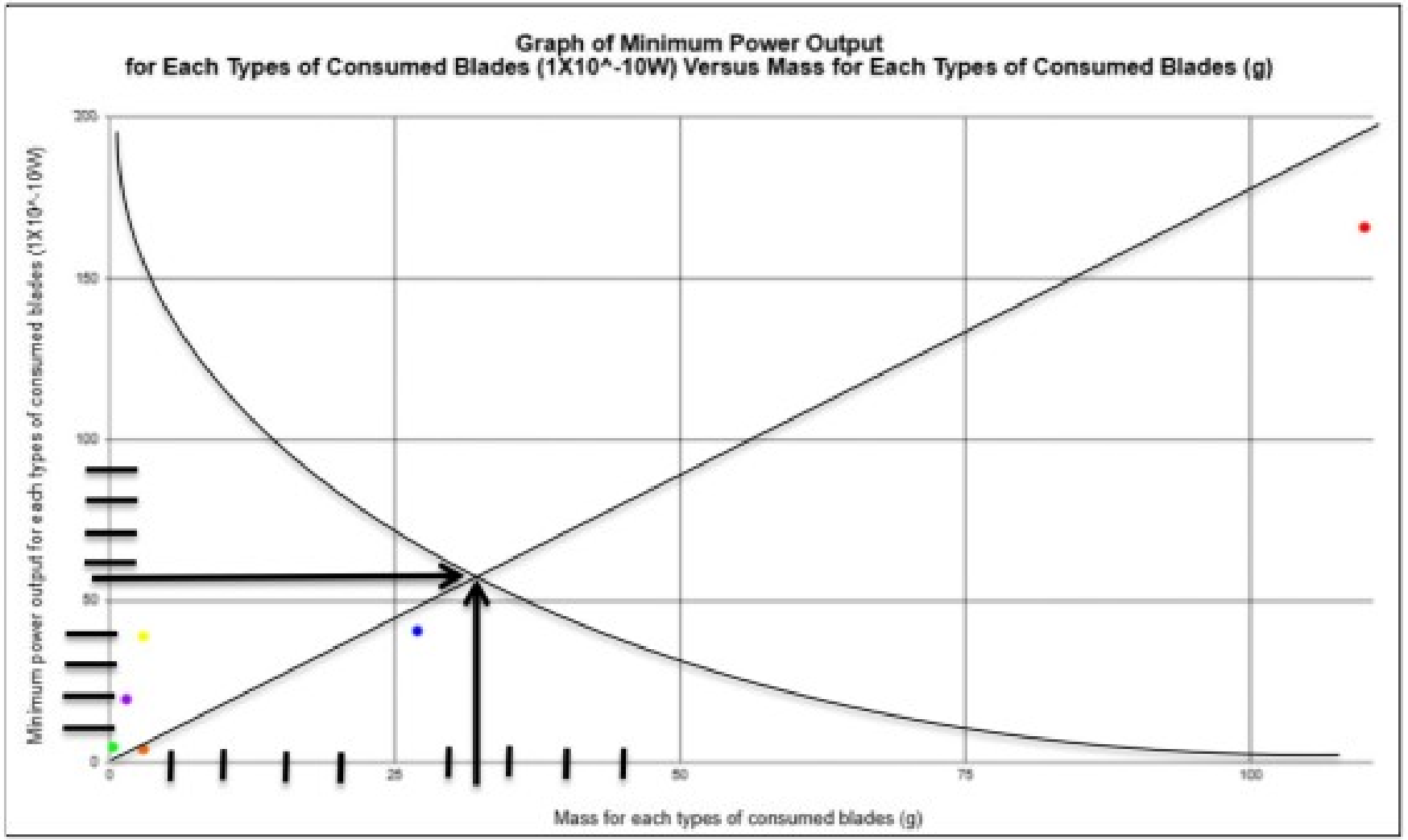

Graph of Percentage of Minumum Power Output for Each Types of Consumed Blades (%) Versus Mass for Each Types of Consumed Blades (g)
Graph of Percentage of Minumum Power Output for Each Types of Consumed Blades (%)
100
75
50
25
0
0
25
50
75
100
Mass for each types of consumed blades (g)

Graph of Percentage of Minimum Power Output for Each Types of Consumed Blades (%) Versus Mass for Each Types of Consumed Blades (g)

$$(P_{\text{types of the materials minimum output}} \div P_{\text{types of the materials minimum input}}) \times 100\%$$
$$= (F_{\text{types of the materials minimum output}} \times v_{\text{types of the materials minimum output}}) \div P_{\text{types of the materials minimum input}}$$
$$= (m_{\text{types of the materials}} \times a_{\text{types of the materials minimum output}} \times v_{\text{types of the materials minimum output}}) \div P_{\text{types of the materials minimum input}}$$
$$= (P_{\text{types of the materials minimum output}}) \div (m_{\text{types of the materials}} \times a_{\text{types of the materials minimum output}} \times v_{\text{types of the materials minimum output}})$$

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

Graph of Minimum Power Output for Each Types of Consumed Blades (1×10-10W) Versus Mass for Each Types of Consumed Blades (g) when percentage terms involved



https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

Graph of Minimum Power Output for Each Types of Consumed Blades (1×10-10W) Versus Mass for Each Types of Consumed Blades (g) when percentage terms involved

$$(P_{\text{types of the materials minimum output}} \div P_{\text{types of the materials minimum input}}) \times 100\%$$

$$= (F_{\text{types of the materials minimum output}} \times v_{\text{types of the materials minimum output}}) \div P_{\text{types of the materials minimum input}}$$

$$= (m_{\text{types of the materials}} \times a_{\text{types of the materials minimum output}} \times v_{\text{types of the materials minimum output}}) \div P_{\text{types of the materials minimum input}}$$

$$= (P_{\text{types of the materials minimum output}}) \div (m_{\text{types of the materials}} \times a_{\text{types of the materials minimum output}} \times v_{\text{types of the materials minimum output}})$$

$$P_{\text{types of the materials minimum}}$$

$$= (F_{\text{types of the materials minimum}} \times v_{\text{types of the materials minimum}})$$

$$= (m_{\text{types of the materials minimum}} \times a_{\text{types of the materials minimum}} \times v_{\text{types of the materials minimum}})$$

For the minimum interception point,

$$(m_{\text{types of the materials minimum}} \times a_{\text{types of the materials minimum}} \times v_{\text{types of the materials minimum}})$$

$$= (P_{\text{types of the materials minimum output}}) \div (m_{\text{types of the materials}} \times a_{\text{types of the materials minimum output}} \times v_{\text{types of the materials minimum output}})$$

$$(m_{\text{types of the materials}} \times a_{\text{types of the materials minimum output}} \times v_{\text{types of the materials minimum output}})^2$$

$$= (P_{\text{types of the materials minimum output}})$$

From the Graph of Minimum Power Output for Each Types of Consumed Blades (1×10^{-10}W) Versus Mass for Each Types of Consumed Blades (g) when percentage terms involved,

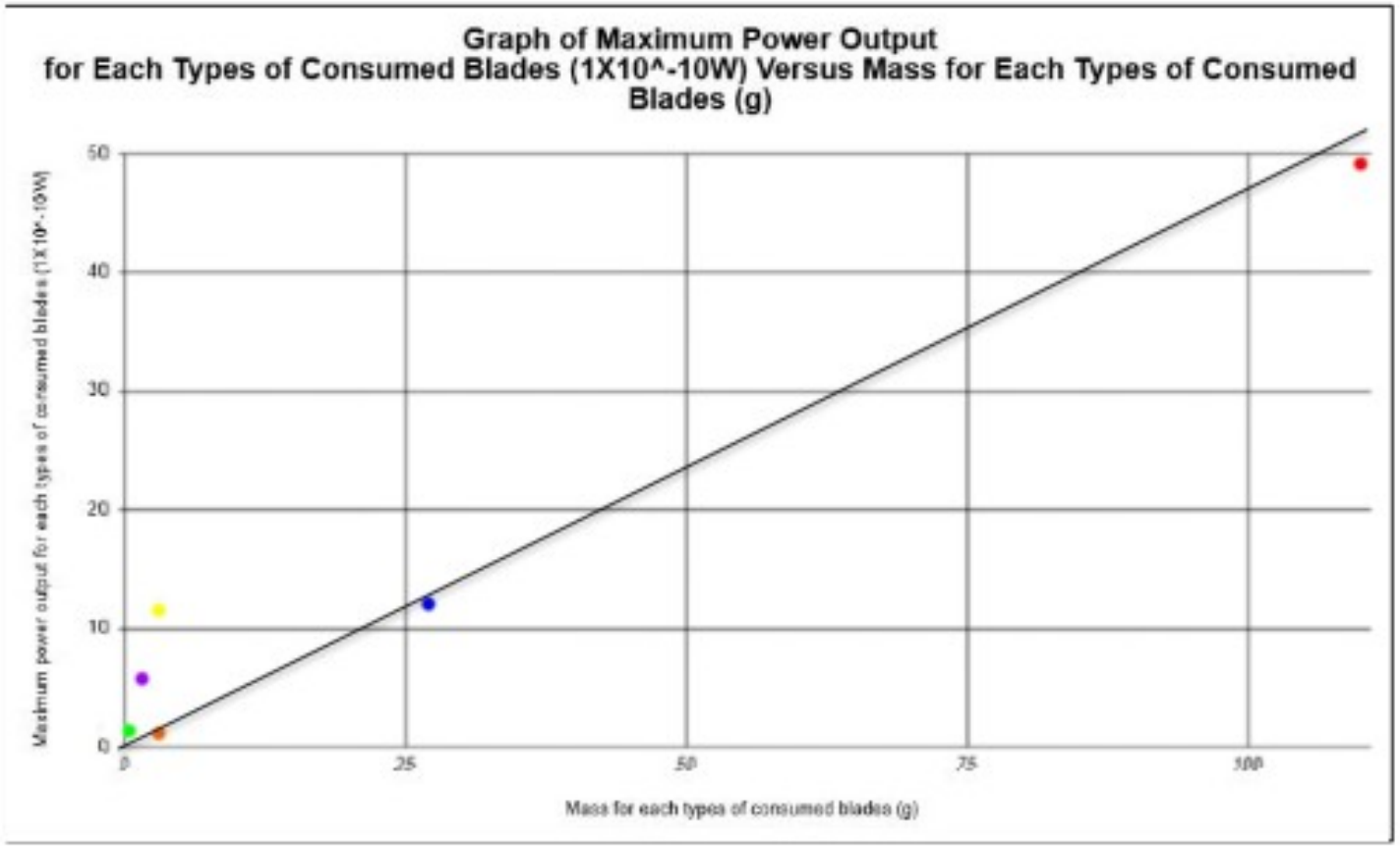
When $m_{\text{types of the materials}} = 32.5\text{g}$, then, $(P_{\text{types of the materials minimum output}}) = 51 \times 10^{-10}\text{W}$

Therefore, the minimum interception point will be $(32.5\text{g}, 51 \times 10^{-10}\text{W})$

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

GRAPHICAL ANALYSIS FOR MAXIMUM DURATION CONSUMPTION

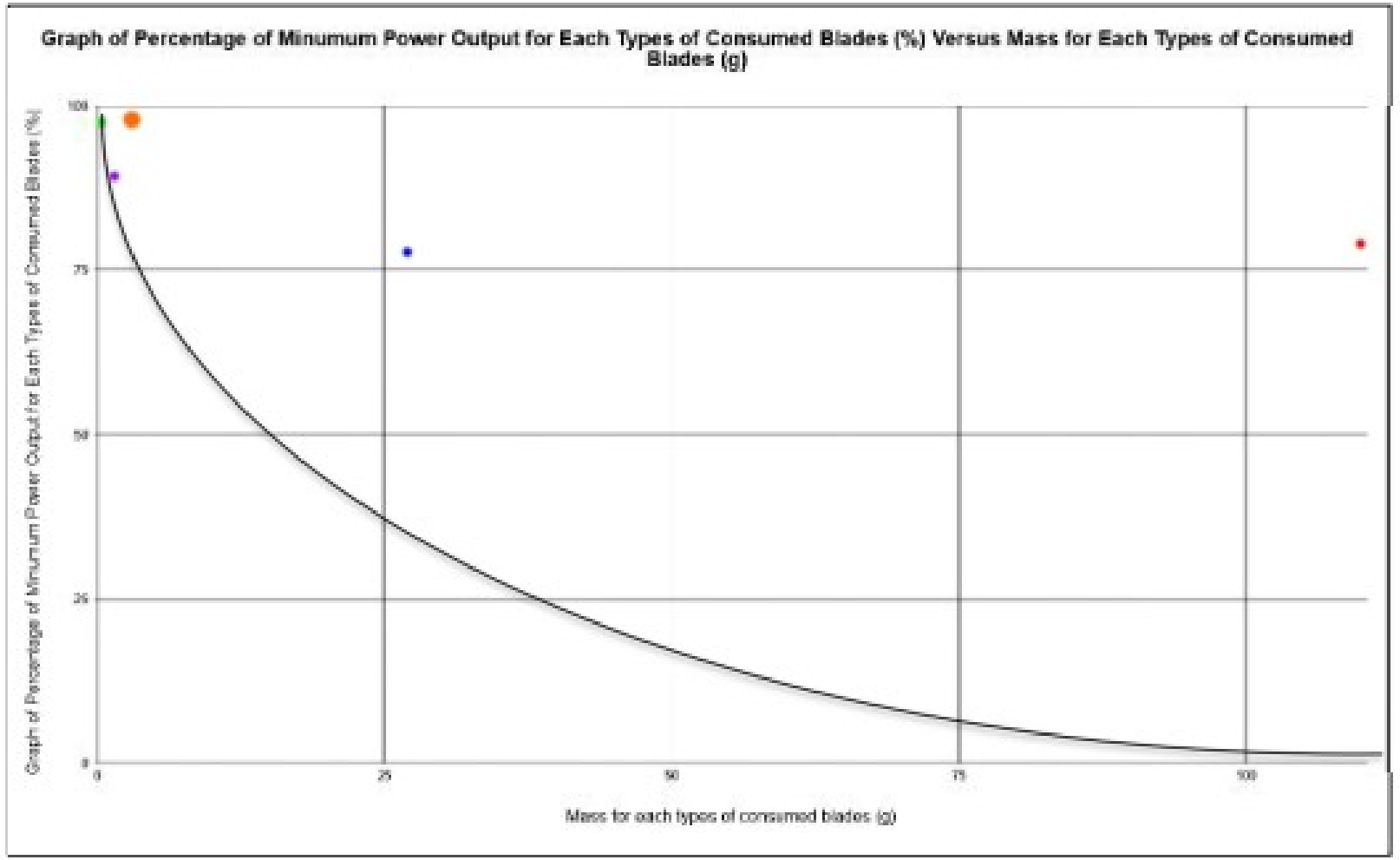
https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib



Graph of Maximum Power Output for Each Types of Consumed Blades (1×10-10W) Versus Mass for Each Types of Consumed Blades (g)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

$$P_{\text{types of the materials minimum}} = (F_{\text{types of the materials minimum}} \times V_{\text{types of the materials minimum}}) = (m_{\text{types of the materials minimum}} \times a_{\text{types of the materials minimum}} \times V_{\text{types of the materials minimum}})$$

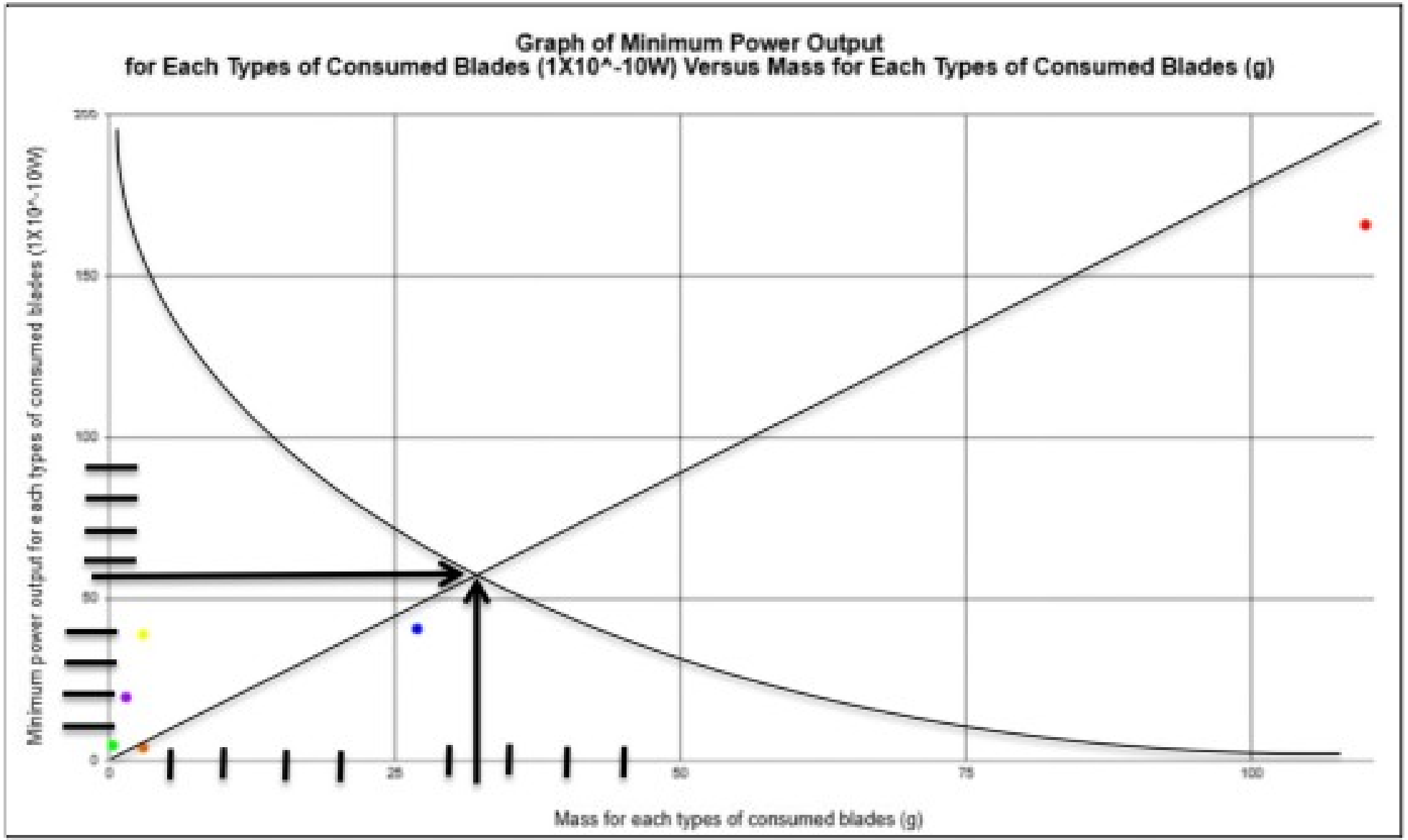

Graph of Percentage of Minumum Power Output for Each Types of Consumed Blades (%) Versus Mass for Each Types of Consumed Blades (g)
Graph of Percentage of Minumum Power Output for Each Types of Consumed Blades (%)
Mass for each types of consumed blades (g)

Graph of Percentage of Maximum Power Output for Each Types of Consumed Blades (%) Versus Mass for Each Types of Consumed Blades (g)

$$(P_{\text{types of the materials minimum output}} \div P_{\text{types of the materials minimum input}}) \times 100\%$$
$$= (F_{\text{types of the materials minimum output}} \times v_{\text{types of the materials minimum output}}) \div P_{\text{types of the materials minimum input}}$$
$$= (m_{\text{types of the materials}} \times a_{\text{types of the materials minimum output}} \times v_{\text{types of the materials minimum output}}) \div P_{\text{types of the materials minimum input}}$$
$$= (P_{\text{types of the materials minimum output}}) \div (m_{\text{types of the materials}} \times a_{\text{types of the materials minimum output}} \times v_{\text{types of the materials minimum output}})$$

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

Graph of Maximum Power Output for Each Types of Consumed Blades (1×10-10W) Versus Mass for Each Types of Consumed Blades (g) when percentage terms


Graph of Minimum Power Output
for Each Types of Consumed Blades (1X10^-10W) Versus Mass for Each Types of Consumed Blades (g)
Minimum power output for each types of consumed blades (1X10^-10W)
Mass for each types of consumed blades (g)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

Graph of Maximum Power Output for Each Types of Consumed Blades (1×10-10W) Versus Mass for Each Types of Consumed Blades (g) when percentage terms

$$(P_{\text{types of the materials minimum output}} \div P_{\text{types of the materials minimum input}}) \times 100\%$$

$$= (F_{\text{types of the materials minimum output}} \times v_{\text{types of the materials minimum output}}) \div P_{\text{types of the materials minimum input}}$$

$$= (m_{\text{types of the materials}} \times a_{\text{types of the materials minimum output}} \times v_{\text{types of the materials minimum output}}) \div P_{\text{types of the materials minimum input}}$$

$$= (P_{\text{types of the materials minimum output}}) \div (m_{\text{types of the materials}} \times a_{\text{types of the materials minimum output}} \times v_{\text{types of the materials minimum output}})$$

$$P_{\text{types of the materials minimum}}$$

$$= (F_{\text{types of the materials minimum}} \times v_{\text{types of the materials minimum}})$$

$$= (m_{\text{types of the materials minimum}} \times a_{\text{types of the materials minimum}} \times v_{\text{types of the materials minimum}})$$

For the minimum interception point,

$$(m_{\text{types of the materials minimum}} \times a_{\text{types of the materials minimum}} \times v_{\text{types of the materials minimum}})$$

$$= (P_{\text{types of the materials minimum output}}) \div (m_{\text{types of the materials}} \times a_{\text{types of the materials minimum output}} \times v_{\text{types of the materials minimum output}})$$

$$(m_{\text{types of the materials}} \times a_{\text{types of the materials minimum output}} \times v_{\text{types of the materials minimum output}})^2$$

$$= (P_{\text{types of the materials minimum output}})$$

From the Graph of Minimum Power Output for Each Types of Consumed Blades (1×10^{-10}W) Versus Mass for Each Types of Consumed Blades (g) when percentage terms involved,

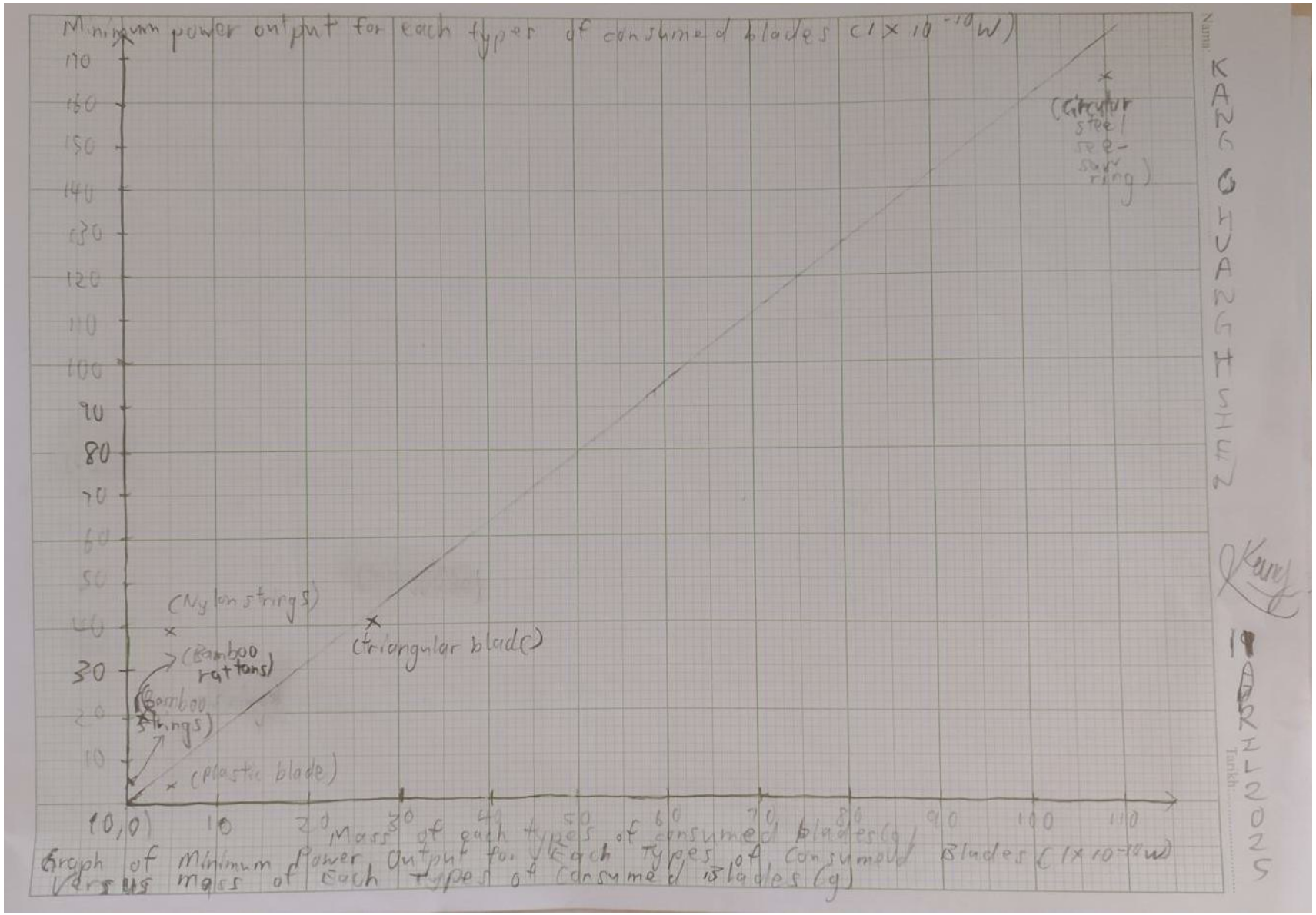
When $m_{\text{types of the materials}} = 32.5$g, then, $(P_{\text{types of the materials minimum output}}) = 51 \times 10^{-10}$W

Therefore, the minimum interception point will be (32.5g , 51×10^{-10}W)

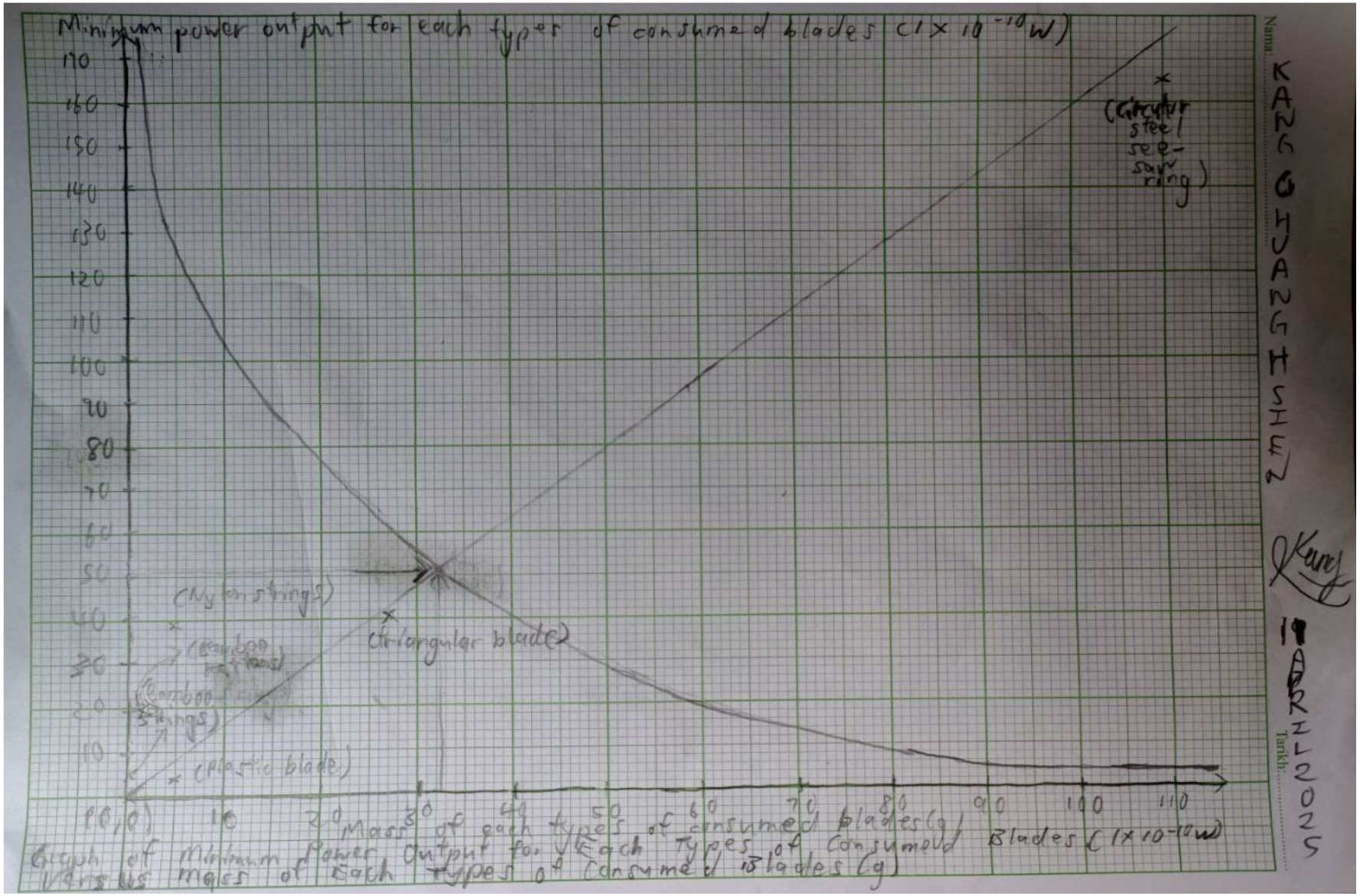
https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

HAND-PLOTTED FOR MINIMUM DURATION CONSUMPTION

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib


Minimum power output for each types of consumed blades (1 × 10⁻¹⁰ W)
(Circular steel re-story ring)
(Nylon strings)
(Triangular blade)
(Bamboo rattans)
(Bamboo strings)
(Plastic blade)
(0,0)
Mass of each types of consumed blades (g)
Graph of Minimum power output for each types of consumed blades (1 × 10⁻¹⁰ W) versus mass of each types of consumed blades (g)
Name: KARA GHANASHYAM
APRIL 2025

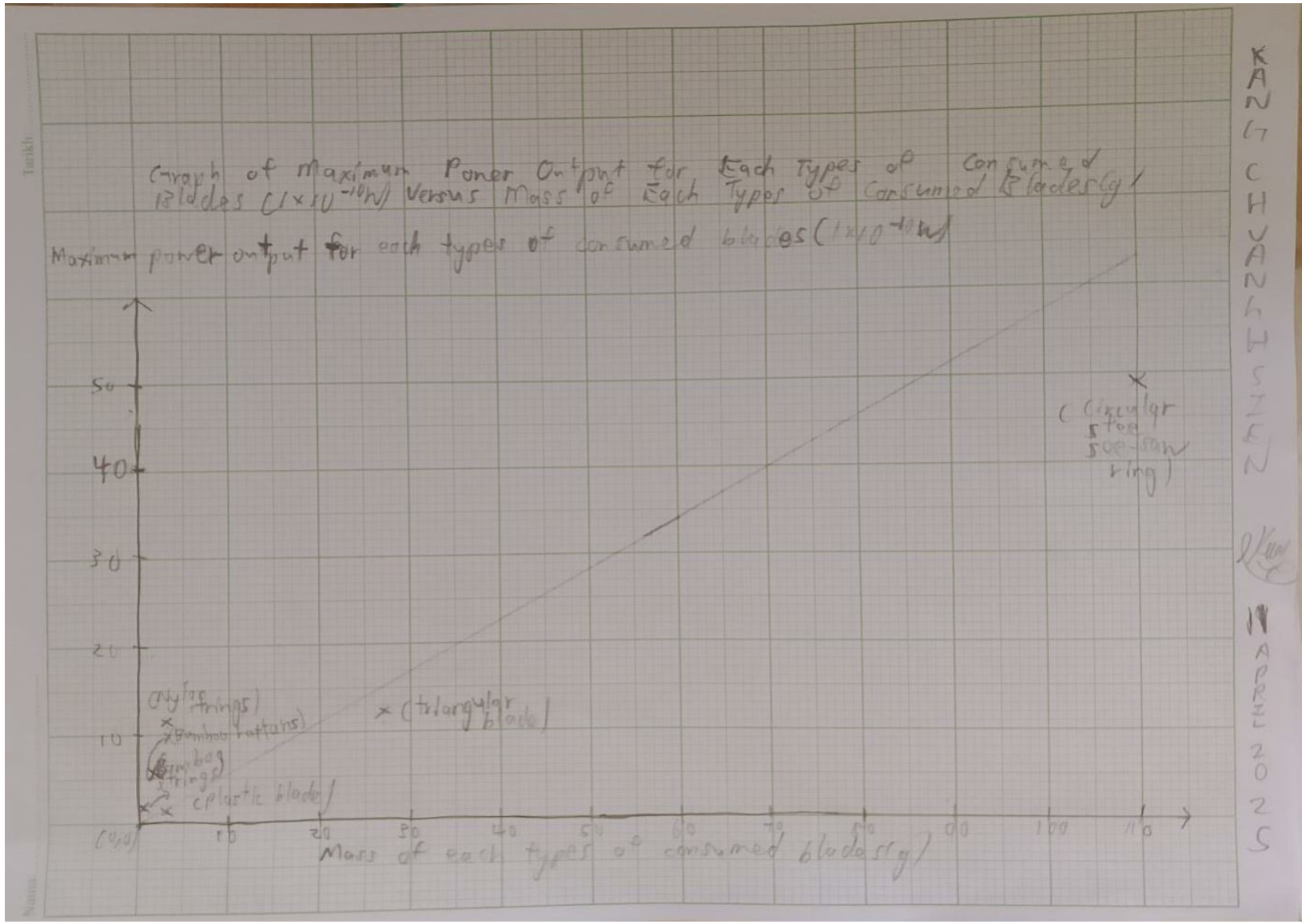
https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib


Minimum power output for each types of consumed blades (1 x 10 -10 W)
(Circular steel saw-ring)
(Nylon strings)
(rectangular blade)
(bamboo strings)
(plastic blade)
Mass of each types of consumed blades (g)
Graph of Minimum of power output for each types of consumed blades (1 x 10-10 W) versus mass of each types of consumed blades (g)
Nama: KANG GUANG SHENG
Tarikh: 19 MARCH 2025

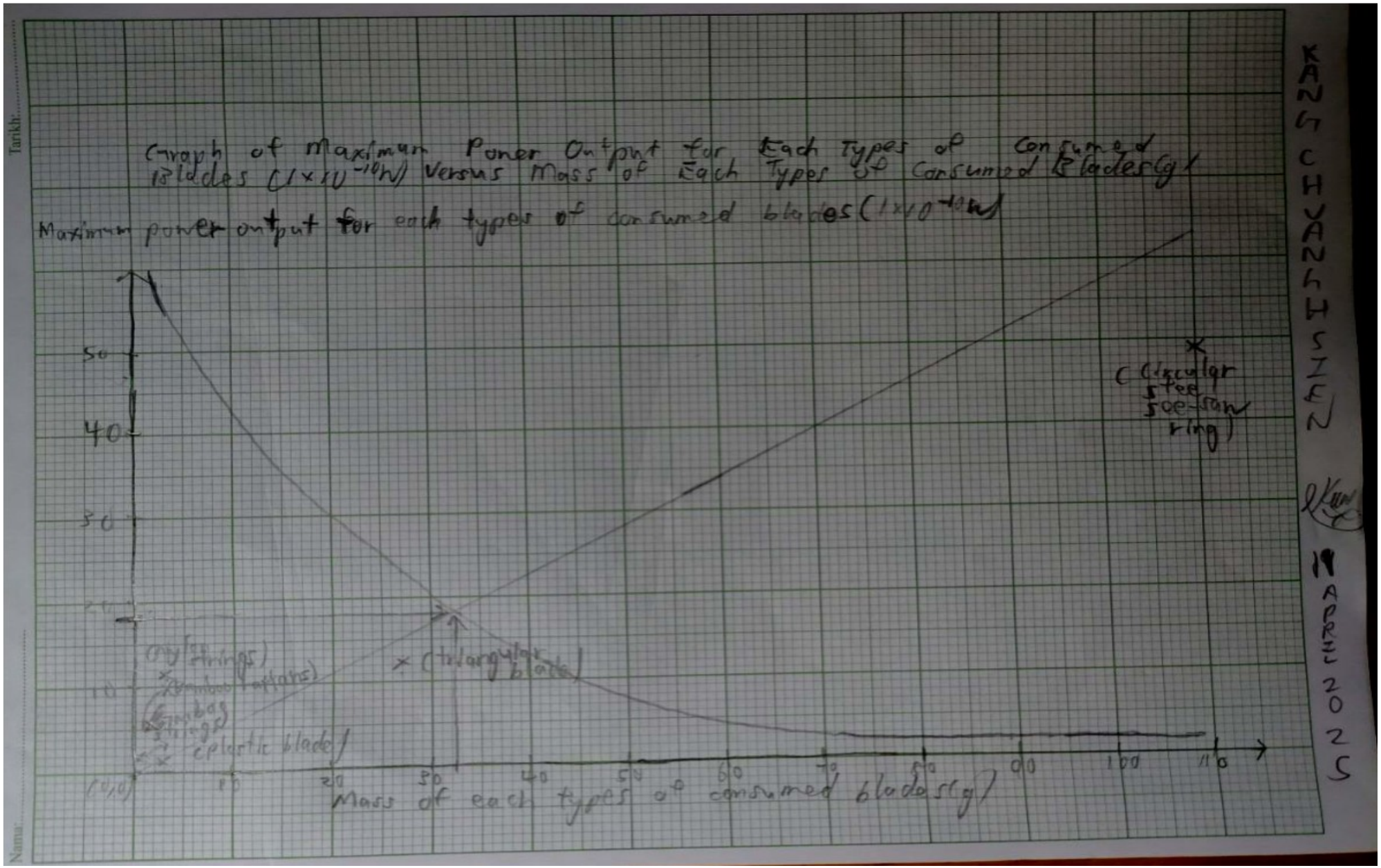
https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

HAND-PLOTTED FOR MAXIMUM DURATION CONSUMPTION

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib



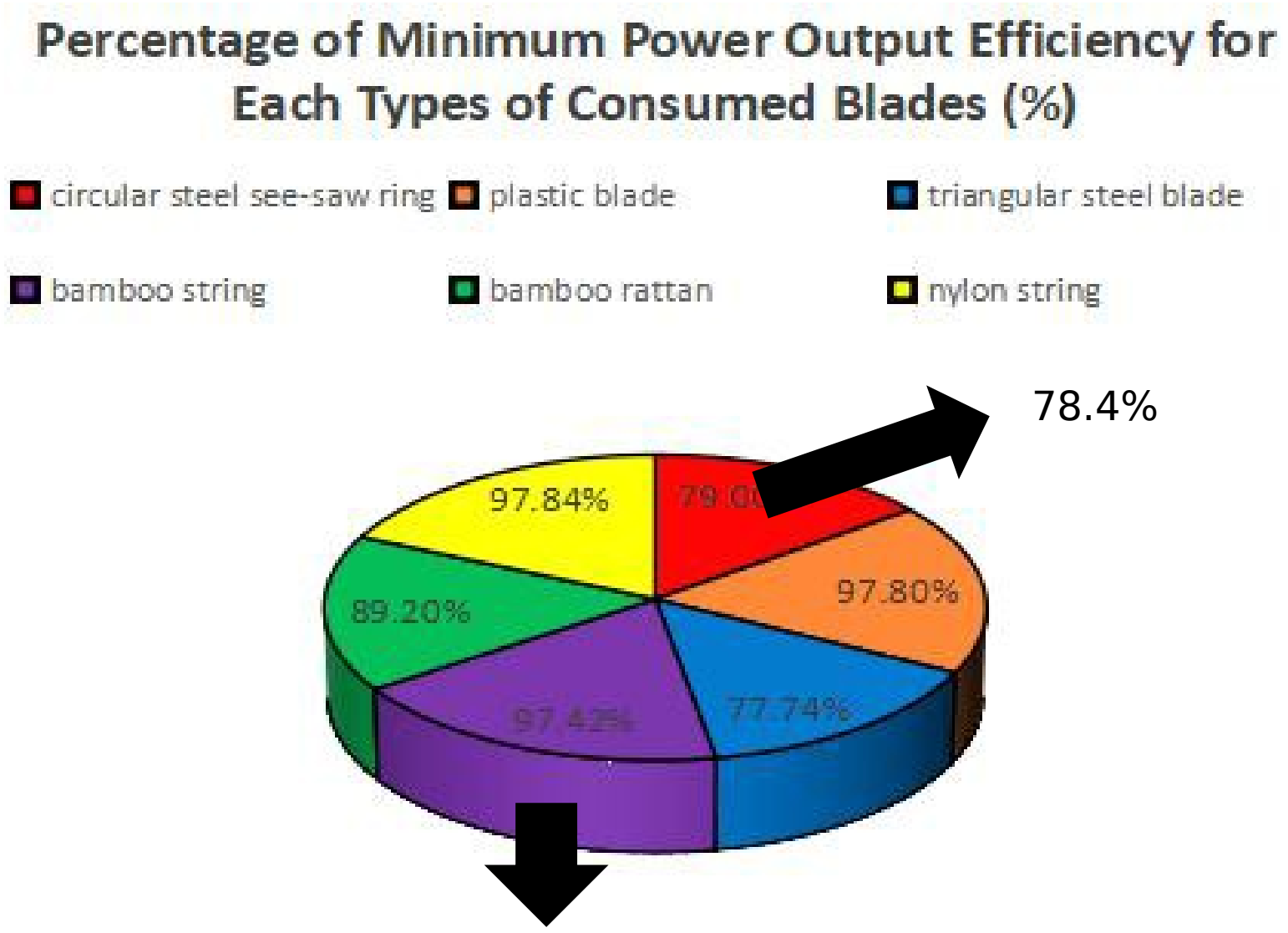
https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib



https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

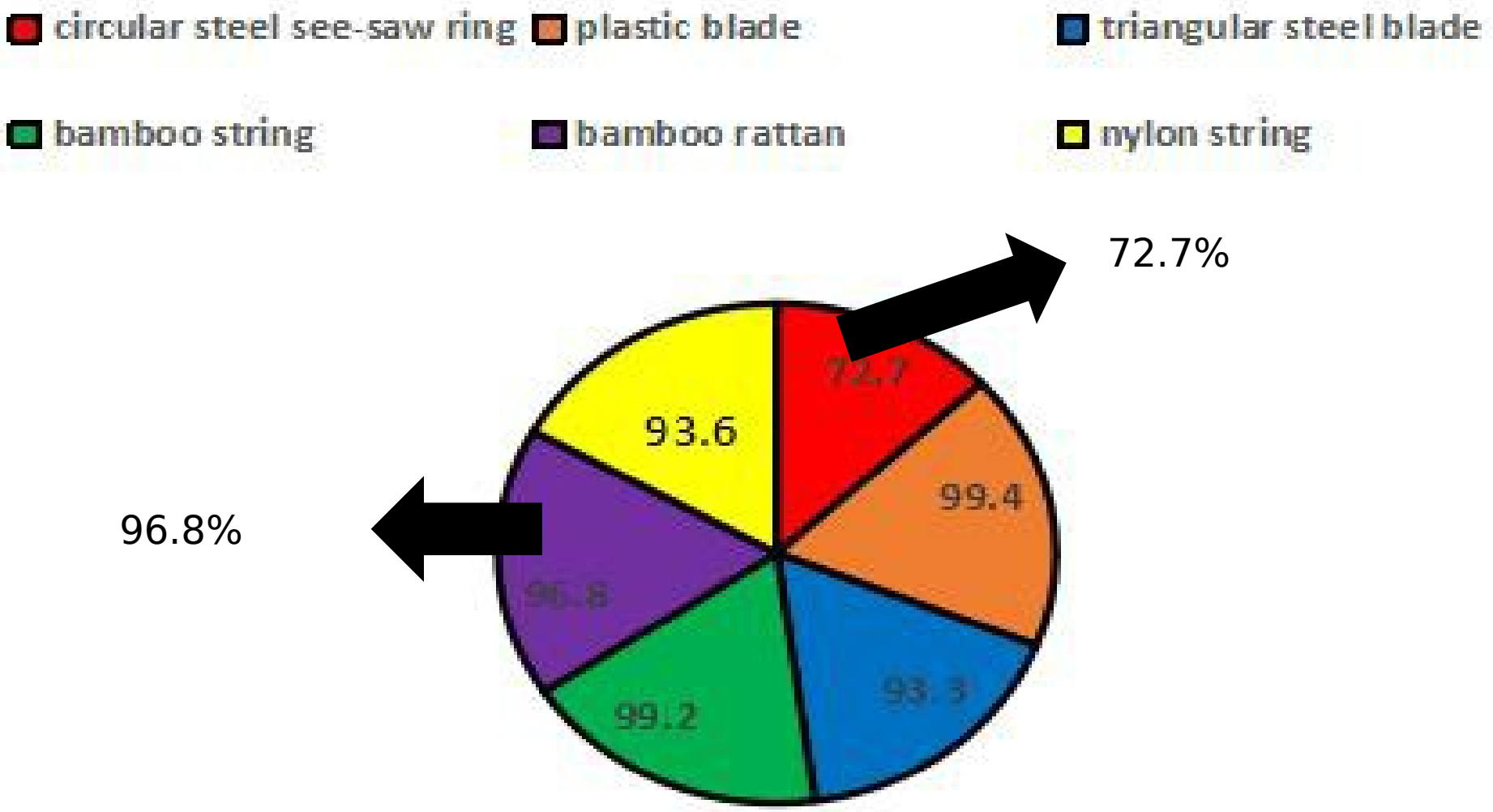
COMPARISON AMONGST PERCENTAGE FOR MINIMUM OUTPUT AND MAXIMUM OUTPUT EFFICIENCY FOR EACH TYPES OF CONSUMED BLADES (%)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib



https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

Percentage of Maximum Power Output Efficiency for Each Types of Consumed Blades (%)



https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

Circular steel see-saw ring, plastic blade, triangular steel blade, bamboo rattan, bamboo string and nylon string have respective colour symbolization such as red, orange, blue, purple, green and yellow for graphical section.

The percentage of the minimum power output for each types of consumed blades is inversely proportional to the mass for each types of consumed blade whereby the sequences order will be from bamboo string, bamboo rattan, plastic blade, nylon string, triangular steel blade and circular see-saw ring steel ring.

The percentage of the maximum power output for each types of consumed blades is inversely proportional to the mass for each types of consumed blade whereby the sequences order will be from bamboo string, bamboo rattan, plastic blade, nylon string, triangular steel blade and circular see-saw ring steel blade.

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

The minimum power output for each types of consumed blades is linearly proportional to the mass for each types of consumed blade whereby the sequences order will be from bamboo string, bamboo rattan, plastic blade, nylon string, triangular steel blade and circular see-saw ring steel ring.

The maximum power output for each types of consumed blades is linearly proportional to the mass for each types of consumed blade whereby the sequences order will be from bamboo string, bamboo rattan, plastic blade, nylon string, triangular steel blade and circular see-saw ring steel blade.

If bamboo string is chosen, although it is lighter and thinner, it is low in the elasticity constant properties and characteristics, causing the elasticity forces produced between the trimmer and the trimmed grass to be reduced. Another extra points here will be the cutting effect of bamboo string is low and not to be picked. Thus, it is very very crucial to judge in variety chemical and physical characteristics and properties for the sake of selecting the great types of consumed blades from different materials backgrounds.

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

APPENDICES & APPENDIX

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Extra safety helmet with the transparent wind shield during trimming grass actions and activities)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib

(Extra safety shoes during trimming grass actions and activities)

https://youtu.be/4AlaM2lJPVQ?si=nbcGlc5oOg7f3uib